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USING THE FIVE-FACTOR MODEL OF PERSONALITY

AS A FRAMEWORK FOR GUIDING
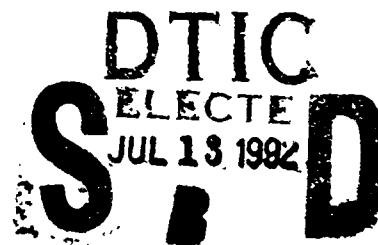
PERSONALITY-HEALTH RESEARCH

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Framework for Guiding Personality-Health Research

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SUMMARY

Physical health problems are common in Navy personnel, and the cost of impaired physical health is substantial. Personality variables have long been studied as possible factors influencing health and physical readiness. At present, however, much research in the area can be characterized as having led to isolated pockets of knowledge pertaining to narrowly-defined personality constructs of unknown relationship to one another.

The current research was undertaken with two central aims: (1) to examine the extent to which the vast number of self-report personality instruments commonly employed in studying personality-health relations can be understood with reference to a smaller number of dimensions of personality, and (2) to determine the degree to which these dimensions correspond with fundamental domains of personality derived from basic personality research.

Two samples of Navy recruit volunteers completed personality measures at the beginning of basic training. Health-relevant personality instruments were selected to tap four recurring conceptual themes identified in past research: (1) the propensity to view life favorably (optimism/hope), (2) the tendency to regard oneself as capable and worthy (personal control/competency), (3) the disposition to experience negative emotions like anger and anxiety (negative affectivity), and (4) the inclination to express or inhibit negative emotions (emotional control). To measure five global dimensions of personality (i.e., neuroticism, extraversion, agreeableness, conscientiousness, and openness to experience), an abbreviated form of the NEO Personality Inventory was used.

Data analyses were performed in two major stages. First, factor analysis of health-relevant personality instruments was conducted. The results of these analyses indicated that numerous indexes commonly used in the study of personality-health relations can be interpreted--at a higher level of abstraction--in terms of three superordinate dimensions. Second, the relationship between health-relevant personality constructs and broad domains of personality, as assessed by the NEO Personality Inventory, was examined. The results of these analyses suggested that the majority of health-relevant indexes tapped aspects of neuroticism, extraversion, and agreeableness. By contrast, the general personality domains of conscientiousness and openness to experience appear to be relatively neglected in personality-health research.

Overall, these results demonstrate the potential unifying value of the five-factor model of personality. Rather than studying discrete facets of personality in isolation from one another, a unified network of health-relevant constructs--anchored by fundamental dimensions of personality--can provide a richer context in which to examine the potential link between personality and health.

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INTRODUCTION

The notion that characteristic patterns of thinking, feeling, and acting might influence vulnerability to illness and illness progression continues to attract widespread attention. The vigorous pace of health-related personality research offers the promise of achieving important insights into the potential role of personality in health maintenance and promotion. At present, however, much research in the area can be characterized as having led to isolated pockets of knowledge pertaining to narrowly-defined constructs of unknown relationship to one another (see Costa & McCrae, 1987; Holroyd & Coyne, 1987). By contrast, relatively little attention has been directed at synthesis of the vast number of personality constructs purported to help explain why certain people are healthier than others.

As a result, numerous alternatives now exist for measuring ostensibly similar health-relevant constructs like hope and optimism (Beck, Weissman, Lester, & Trexler, 1974; Dember & Brooks, 1989; Scheier & Carver, 1985; Snyder et al., 1991). Conversely, a large number of purportedly unique constructs have been operationalized using highly similar item content, e.g., self-mastery, generalized self-efficacy, generalized expectancy for success, and self-faith (cf. Fibel & Hale, 1978; Pearlin & Schooler, 1978; Tipton, Harrison, & Mahoney, 1980; Tipton & Worthington, 1984), raising issues regarding the utility of such distinctions.

Moreover, in those instances in which the apparent salutary benefits of relatively circumscribed personality constructs like personal hardiness (Kobasa, 1979) and dispositional optimism (Scheier & Carver, 1985) have come under close scrutiny, these effects have been reattributed to broader dimensions of personality like the disposition to experience emotional distress (Funk & Houston, 1987; Smith, Pope, Rhodewalt, & Poulton, 1989). Interestingly, the link between hardiness and well-being has also been ascribed to even more finely-differentiated components of hardiness (Hull, Van Treuren, & Virnelli, 1987).

Without reference to a unified framework of personality, the plethora of constructs--and methods of measuring them--pose several problems for the progression of health-related personality research. At a most basic level, the large number of instruments measuring similar constructs leaves the typical researcher with little rationale for selecting one measurement strategy over another. Second, extrapolation across studies employing different, but seemingly similar,

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constructs may be misleading in the absence of empirical evidence of convergent validity. Third, without specifying the empirical relations among various dimensions of personality, it is not possible to determine whether a given personality construct possesses unique explanatory power, acts in concert with other relatively distinct dimensions, or is essentially redundant with existing constructs (Carver, 1989). Finally, without a well-defined frame of reference, it is difficult to determine whether the full range of potentially relevant domains of personality are adequately represented in current health psychology research.

Although there have been occasional calls for clarification of the relationship of health-relevant personality constructs with respect to well-established dimensions of personality (Costa & McCrae, 1987; Holroyd & Coyne, 1987), as yet no systematic effort has been undertaken. The current research was designed with two central aims: (1) to examine the extent to which the bewildering number of personality instruments commonly employed in studying personality-health relations can be understood with reference to a smaller number of dimensions of personality, and (2) to determine the degree to which these dimensions converge with fundamental domains of personality derived from basic personality research (Digman, 1990).

METHOD

Subjects

Data were obtained from two independent samples of Navy recruits undergoing the first week of basic military training. All participants volunteered as part of a series of studies examining the relations among personality, mood, and well-being. Approximately 95% of available recruits agreed to participate. With respect to demographics, approximately 73% of Sample 1 (N = 292) were non-Hispanic Caucasians, 15% were Black, 8% were Hispanic, and 4% were from other groups, principally Asian, Guamanian and Filipino. The mean age was approximately 19 years (SD = 2.68); the majority of respondents (89%) had received a high school diploma or its equivalent. For Sample 2 (N = 451), approximately 65% were non-Hispanic Caucasians, 17% were Black, and 11% were Hispanic, and 7% were from other groups, principally Asian, Guamanian, and Filipino. The mean age was approximately 18 years (SD = 2.02); the majority of respondents (94%) had received a high school diploma or its equivalent.

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Instrument Selection and Response Format

<u>Constructs implicated in health research</u>. Drawing from our own review of the literature as well as from published research reviews (Cohen & Edwards, 1989; Endler, 1988; Friedman & Booth-Kewley, 1987; Jemmott & Locke, 1984), a list of constructs implicated in the study of personality and health was developed. On rational grounds, recurring content areas were organized into four conceptual themes: (1) the propensity to view life favorably (optimism/hope), (2) the tendency to regard oneself as capable and worthy (personal control/competency), (3) the disposition to experience negative emotions like anger and anxiety (negative affectivity), and (4) the inclination to express or inhibit expression of negative emotions (emotional control). Within each of these broad groupings, representative instruments were chosen on the basis of psychometric adequacy, overall questionnaire length, and frequency of appearance in the health psychology literature. Given the widespread use of most of these scales, readers are referred to original sources for information regarding psychometric characteristics.

<u>Fundamental dimensions of personality</u>. To evaluate the convergence between broad dimensions of personality and those constructs commonly-used in health research, we adopted a five-factor model of personality. Although alternative schemes invoking differing numbers of dimensions have been proposed, a large body of research suggests that the domain of personality can be adequately represented using five broad dimensions, the so-called "Big Five" (Digman & Inouye, 1986; Goldberg, 1990; McCrae & Costa, 1987).

To assess these dimensions, an abbreviated version of the Neuroticism-Extraversion-Openness Personality Inventory (NEO-PI; Costa & McCrae, 1989a), i.e., the NEO Five Factor Inventory (NEO-FFI; Costa & McCrae, 1989b), was selected. As operationalized by this instrument, five 12-item scales tap five broad personality domains: <u>neuroticism</u> (N), the tendency to experience emotional distress; <u>extraversion</u> (E), the disposition toward positive emotions, sociability, and high levels of activity; <u>openness</u> (O), a receptive orientation toward varied experiences and ideas; <u>conscientiousness</u> (C), the tendency toward persistence, industriousness, and organization; and <u>agreeableness</u> (A), the inclination toward interpersonal trust and consideration of others. The NEO-FFI possesses satisfactory psychometric properties and corresponds well with the full 181-item instrument (Costa & McCrae, 1989a,b).

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Response format. In their original format, response options for all instruments ranged from dichotomous to seven-point scales. To ease administration, most instruments were answered using a modal five-point scale ranging from (^{1}) "strongly disagree" to (5) "strongly agree." To maintain comparability, however, *four instruments developed by Spielberger and colleagues* (State-Trait Personality Inventory, Spielberger et al., 1979; Anger Expression Scale, Spielberger et al, 1986; Self-Analysis: Angry and Furious Scale, Spielberger, Krasner, & Soloman, 1987; Interpersonal Behavior Scale, Spielberger, Soloman, & Krasner, 1987) were answered on a four-point scale ranging from (1) "almost never" to (4) "almost always."

Data Collection and Analysis

Data collection. Responses were obtained in group sessions. Questionnaires were presented orally, as well as visually, to facilitate mass testing and to minimize problems associated with varying levels of reading ability. Intact scales were grouped by general content area. Within each content area, order of presentation of each scale was randomly determined. The NEO-FFI was administered last.

Data analysis. Data analyses were conducted in three phases. Phases one and two employed factor analysis to examine the structure of health-relevant personality measures. Several methods of factor extraction and rotation were used. Because all methods yielded essentially identical findings, only the results of principal factor analysis with orthogonal (varimax) rotation are reported. In phase one, exploratory factor analyses of each individual scale or instrument were conducted to determine their dimensional structure. In some instances, these analyses resulted in elimination of poor items or creation of additional indexes to distinguish between multiple facets of putatively unidimensional constructs. In phase two, the resulting indexes were themselves factor analyzed to determine the number of superordinate personality dimensions which could be identified. Finally, using moderated multiple regression, the individual indexes were examined with reference to the five-factor model of personality as measured by the NEO-FFI.

RESULTS

Dimensionality of Health-Relevant Personality Instruments

Optimism. The Life Orientation Test (LOT; Scheier & Carver, 1985) was included as a measure of the degree to which individuals possess favorable expectations regarding life outcomes. Factor analysis of this eight-item scale identified two factors with eigenvalues exceeding 1.0, which accounted for 56% and 52% of the total variance. For both samples 1 (3.17, 1.28) and 2 (2.98, 1.16), a scree plot of factor roots suggested extraction of two factors. Thus, although the LOT is typically treated as unidimensional, these results support categorization of LOT items into separate optimism and pessimism dimensions (see Appendix 1, Table A).

Hopelessness Scale. The Hopelessness Scale (HS; Beck et al., 1974) was included to assess the extent to which individuals are hopeful or pessimistic about their future. Factor analysis of this twenty-item instrument produced three factors with eigenvalues exceeding 1.0 in Samples 1 (8.05, 1.37, 1.02) and 2 (8.24, 1.36, 1.06). However, a scree plot of factor roots was consistent with extraction of two factors, which accounted for 47% and 48% of the total variance. Factor loadings for the two-factor solutions are shown in Appendix 1, Table B. These analyses supported categorization of the HS into separate factors tapping pessimism and optimism.

Faith-in-Self. The Faith-in-Self Scale (FS; Tipton, Harrison, & Mahoney, 1980) was used to assess perceived personal efficacy. Factor analysis of this seven-item scale revealed two factors with eigenvalues exceeding 1.0 in both Samples 1 (2.43, 1.21) and 2 (2.93, 1.00), which accounted for 56% and 52% of the total variance. A scree plot of factor variances suggested retention of a single factor. Examination of both solutions revealed two items with little relation to the remaining five. Deletion of these two items resulted in a five-item scale that was clearly unidimensional. These five items are shown in Appendix 1, Table C.

Purpose-in-Life. The extent to which life provides a sense of meaning and fulfillment was assessed using the 10-item Purpose-in-Life Scale (PIL) developed by Reker and Peacock (1981). Factor analysis revealed two eigenvalues exceeding 1.0 in both Samples 1 (3.53, 1.03) and 2 (4.00, 1.08). However, a scree plot of factor roots suggested retention of a single factor which accounted for 35% and 40% of the total variance. Moreover, the content of the two-factor solution was highly unstable across the two samples.

Internal-External Control. Internal-external control was assessed using eight items derived from Levenson's (1973) Internal Control (four items) and Chance (four items) Locus of Control (LOC) Scales. Factor analysis of these items resulted in two factors with eigenvalues exceeding 1.0 (2.44, 1.17 and 2.35, 1.39), which accounted for 45% and 47% of the total variance. For both samples, a scree plot of factor roots suggested extraction of two factors corresponding to the dimensions of chance and internal control (see Appendix 1, Table D).

Self-Esteem. Self-esteem was assessed using the ten-item Rosenberg (R) Self-Esteem Scale (1979). Factor analysis of this instrument identified two factors with eigenvalues exceeding 1.0 (i.e., 4.35, 1.14, and 4.17, 1.24), which accounted for 55% of the total variance in both samples. A scree plot of factor roots was consistent with retention of either one or two factors. Examination of the two-factor solutions, however, revealed that four of ten items had substantial loadings on both factors. Thus, the ten items were treated as a unidimensional index of the degree to which individuals possess positive attitudes about themselves.

Affect Intensity. Affective response intensity was assessed using an abbreviated version of the Affect Intensity Measure (AIM; Larsen, Diener, & Emmons, 1986). This twenty-two item version of the AIM was developed--due to space considerations--from a prior factor analysis of the full set of forty items in a different sample of 300 Navy recruits (Vickers & Hervig, 1989). Although the AIM is conceptualized as unidimensional, factor analysis of the abbreviated AIM identified six factors with eigenvalues exceeding 1.0 (i.e., 4.19, 3.13, 1.93, 1.33, 1.08, 1.01) in Sample 1. In Sample 2, five factors were identified with eigenvalues exceeding 1.0 (i.e., 3.62, 2.90, 2.26, 1.34, 1.06). For both samples, a scree plot of factor roots suggested extraction of four factors which accounted for 48% and 46% of the total variance. Factor loadings for the four-factor solutions are shown in Appendix 1, Table E. These four dimensions can be characterized as tapping intense positive affect (joy), mild positive affect (contentment), negative affect (shame/empathy), and resistance to stress (imperturbability).

Trait Personality Inventory. The trait version of the State-Trait Personality Inventory (TPI; Spielberger et al., 1979) was used to assess three aspects of emotionality: anger (ten-items), anxiety (ten-items), and curiosity (ten-items). Factor analysis of this instrument yielded six factors with eigenvalues exceeding 1.0 (7.20, 3.45, 2.36, 1.52, 1.24, 1.00 and 6.38, 3.62, 2.70, 1.64, 1.09, 1.05) in both samples. A scree plot of factor roots suggested extraction of three

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factors which accounted for 43% and 42% of the total variance. Factor loadings for the three-factor solutions are shown in Appendix 1, Table F. With a few minor exceptions, the obtained three-factor solution was consistent with the hypothesized structure of this inventory.

Expression of Anger. The Self-Analysis: Angry and Furious Scale (SAAF; Spielberger et al., 1986) was used to measure three strategies individuals employ in response to anger: outward expression of anger (eight-items), inhibition of anger (eight-items), and control of anger (eight-items). Factor analysis of this instrument revealed five factors with eigenvalues greater than 1.0 in both Sample 1 (6.94, 2.99, 1.46, 1.12, 1.00) and Sample 2 (6.10, 2.75, 1.63, 1.10, 1.05). A scree plot of factor roots suggested extraction of three factors. Moreover, the three-factor solutions--which accounted for 48% and 44% of the total variance--were virtually identical to the hypothesized factor structure (see Appendix 1, Table G).

Self-Control. On rational grounds, a subset of ten items assessing self-control of negative emotions were selected from the 36-item Self-Control Schedule (SC; Rosenbaum, 1980). Factor analysis of these items yielded three factors with eigenvalues exceeding 1.0 in Samples 1 (2.64, 1.74, 1.46) and 2 (2.79, 1.61, 1.56), which accounted for 58% and 60% of the total variance. Although a scree plot was consistent with extraction of three factors, one of these factors was composed of two items with highly similar wording referring to pain control. When the items were resubmitted to factor analysis after exclusion of the latter items, two factors emerged. As shown in Appendix 1, Table H, one factor was composed of four items reflecting the ability to alter one's mood in a positive direction by means of personal effort. A second factor was composed of three items assessing the inability to stop intrusive negative thoughts.

Introspectiveness. The tendency to attend to thoughts and feelings about oneself was assessed using the nine-item Introspectiveness Scale (I; Hansell & Mechanic, 1985). Factor analysis of this instrument identified three factors with eigenvalues exceeding 1.0 (i.e., 3.0, 1.73, and 1.16) in Sample 1. Factor analysis of Sample 2 data resulted in three factors with eigenvalues exceeding 1.0 (i.e., 2.96, 1.63, and 1.16). Although scree plots of factor roots were consistent with extraction of either two or three factors, the two-factor solution, which accounted for 53% and 51% of the variance, showed the highest degree of concordance across samples. The first factor was composed of five items tapping motive introspection (e.g., "I often examine my inner motives"). The second factor was composed of three items assessing the tendency to

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Table 1

Descriptive Statistics for Personality Indexes

Index	Sample 1			Sample 2		
	X	SD	Alpha	X	SD	Alpha
N (NEO-FFI)-12	2.92	.64	.82	2.95	.66	.78
E (NEO-FFI)-12	3.48	.53	.75	3.54	.56	.72
O (NEO-FFI)-12	3.21	.48	.62	3.18	.51	.56
C (NEO-FFI)-12	3.64	.56	.81	3.64	.58	.82
A (NEO-FFI)-12	3.33	.48	.70	3.37	.52	.68
Optimism (LOT)-4	3.51	.73	.69	3.54	.69	.61
Pessimism (LOT)-4	2.86	.80	.80	2.83	.79	.74
Optimism (HS)-7	4.03	.63	.85	4.05	.62	.82
Pessimism (HS)-8	2.38	.71	.84	2.38	.76	.86
Self-Faith (FS)-5	4.28	.58	.75	4.23	.60	.76
Life Purpose (PIL)-10	3.49	.61	.78	3.61	.68	.83
Internal (LOC)-4	4.00	.54	.56	3.94	.59	.63
External (LOC)-3	2.81	.86	.65	2.79	.84	.63
Self-Esteem (R)-10	3.68	.63	.85	3.62	.68	.86
Joy (AIM)-5	3.72	.75	.84	3.68	.74	.81
Contentment (AIM)-5	3.22	.77	.79	3.19	.75	.76
Shame/Empathy (AIM)-5	3.36	.67	.68	3.34	.65	.63
Imperturbability (AIM)-7	3.08	.61	.64	3.07	.61	.64
Anger (TPI)-7	2.35	.78	.88	2.49	.66	.85
Anxiety (TPI)-10	2.29	.55	.84	2.35	.55	.83
Curiosity (TPI)-8	2.97	.50	.77	3.12	.50	.80
Anger Out (SAAF)-8	2.20	.62	.83	2.26	.64	.82
Anger In (SAAF)-8	2.31	.52	.70	2.39	.50	.64
Anger Control (SAAF)-8	2.74	.67	.87	2.76	.65	.85
Mood Enhancement (SC)-4	3.71	.74	.74	3.67	.80	.79
Negative Thoughts (SC)-3	3.33	.88	.65	3.32	.84	.56
Motive Reflection (I)-5	3.40	1.07	.77	3.40	1.00	.78
Self Reflection (I)-3	3.72	1.11	.71	3.77	1.05	.72
Rationality (IPBS)-12	2.96	.50	.81	2.86	.52	.82

Note. Item source and number of items included in each index are listed after each index. See test for complete index source.

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think about oneself (e.g., "I think about myself a lot"). One item failed to discriminate between factors and was dropped. This solution corresponded to the dimensions identified by Hansell and Mechanic (1985). Although they construed the two factors as tapping a single construct, it seemed preferable to treat these dimensions as potentially distinct (see Appendix 1, Table I).

Expression of Emotion. The tendency to respond to problematic interpersonal situations by rational--as opposed to emotional--means was assessed using the Interpersonal Behavior Scale (IPBS; Spielberger, Soloman, & Krasner, 1987). Factor analysis of this twelve-item scale identified two factors with eigenvalues exceeding 1.0 (4.25, 1.36 and 4.04, 1.27). However, a scree plot of factor roots suggested that this instrument could be satisfactorily summarized as tapping a single dimension which accounted for 35% and 34% of the total variance. Descriptive statistics for all personality indexes are shown in Table 1.

Identification of Superordinate Dimensions

To examine the relations among the twenty-four personality indexes identified in the preceding analyses, these indexes were themselves submitted to factor analysis. Analysis of both samples produced five factors with eigenvalues exceeding 1.0 (i.e., 7.28, 2.98, 2.35, 1.25, 1.15 and 7.53, 2.55, 2.48, 1.27, 1.09). A scree plot of factor roots revealed a clear break after three factors, which accounted for 53% of the variance in both samples. Moreover, coefficients of congruence showed a sharp drop in magnitude after extraction of a fourth factor, providing evidence that the three-factor solution was the most stable across samples. Factor loadings for the three-factor solutions are shown in Table 2.

These results indicate that the numerous personality indexes commonly used in the study of personality-health relations can be understood in terms of three superordinate dimensions. Factor I was composed of indexes reflecting optimism, positive affect, faith in one's abilities, and the capacity to derive meaning from life. Factor II was composed of indexes reflecting anxiety, negative ruminations, pessimism, and the inhibition of negative emotions. Finally, Factor III was composed of indexes reflecting the extent to which anger is experienced and expressed in an unmodulated, aggressive manner.

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Table 2

Varimax-rotated Factor Loadings for Individual Personality Indexes

Index	I		II		III	
Optimism (HS)	.80	.77				
Joy (AIM)	.73	.70				
Optimism (LOT)	.70	.70				
Purpose-in-Life (PIL)	.65	.70				
Esteem (R)	.61	.64	-.59	-.53		
Mood Enhancement (SC)	.57	.54				
Self-Faith (FS)	.55	.67				
Curiosity (TPI)	.47	.56				
Internality (LOC)	.47	.68				
Anxiety (TPI)	-.41	-.44	.76	.66		
Externality (LOC)			.61	.55		
Negative Thoughts (SC)			.60	.64		
Pessimism (LOT)	-.30	-.48	.61	.54		
Pessimism (HS)	-.54	-.57	.56	.59		
Anger Inhibition (SAAF)			.54	.42		
Motive Reflection (I)		.37	.39	.37		
Anger Control (SAAF)					.83	.82
Anger Expression (SAAF)			.37		-.69	-.73
Anger (TPI)					-.66	-.79
Rationality (IPBS)					.66	.68
Imperturbability (AIM)					.59	.44
Contentment (AIM)					.40	
Shame/Empathy (AIM)	.36					
Self Reflection (I)				.30	.35	

Note. Loadings between -.30 and .30 are not shown. Underlined loadings are based on Sample 2. The source of each index is listed in parentheses.

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This empirically-derived structure differed from the a priori model in two major respects. First, negative affectivity did not emerge as a distinct dimension. Instead, negative affect indexes (e.g., anxiety) converged with negative cognitions (e.g., externality) to form a single dimension. Similarly, indexes reflecting positive affect (e.g., joy) merged with those reflecting positive cognitions (e.g., deriving a sense of meaning from life). Second, the distinction between hope/optimism and personal control/competency collapsed, in like fashion, into aspects of positive affect/cognition and negative affect/cognition. The remaining factor corresponded to the a priori expectation of a domain reflecting emotion management.

Relations between Health-relevant Personality Indexes and Fundamental Dimensions of Personality

To assess the extent to which the 24 health-relevant personality indexes project onto the five fundamental dimensions of personality, each of the indexes were regressed--in stepwise fashion--onto the five NEO-FFI indexes. This strategy was chosen to adjust for the modest interrelationship among some NEO-FFI indexes (see Appendix 1, Table J). To identify potential interaction effects, cross-product terms containing all possible two-way interactions were entered-- in stepwise fashion--into the regression equations after forced entry of all main effects. After pooling the two studies (see Rosenthal, 1978), fewer significant interactions were found than would be expected by chance alone.

Overall, as shown in Table 3, the majority of indexes appeared to tap aspects of either neuroticism, extraversion, or agreeableness. Neuroticism was most closely associated with indexes of anxiety, negative ruminations, low self-esteem, pessimism, externality, and inhibition of anger. Extraversion was defined by indexes tapping positive affect, optimism, a sense of life purpose, and the capacity to exercise self-management of negative emotions. Agreeableness was principally associated with indexes reflecting the expression of anger. In contrast to the disproportionately high representation of indexes tapping neuroticism and extraversion, relatively few indexes tapped the dimensions of openness and conscientiousness. The only relatively pure index of openness was the tendency to reflect on one's inner motives. Similarly, the only indexes of conscientiousness were faith in oneself and internal locus of control.

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Table 3

Relations between Health-relevant Personality Indexes and Fundamental Dimensions of Personality

Index	N		E		O		C		A	
	Beta Weights									

Index	N		E		O		C		A	
Anxiety (TPI)	62	62								
Negative Thoughts (SC)	50	52								
Self-Esteem (R)	-48	-47								
Imperturbability (AIM)	-39	-54								
Pessimism (HS)	40	44								
Pessimism (LOT)	29	44								
Externality (LOC)	38	38								
Anger Inhibition (SAAF)	44	25								
Joy (AIM)			49	45						
Purpose-in-Life (PIL)			38	26						
Contentment (AIM)			-36	-25						
Optimism (HS)			35	22						
Optimism (LOT)			34	37			35	26		
Mood Enhancement (SC)			23	38						
Motive Reflection (I)					42	41				
Curiosity (TPI)			31	19	37	35				
Self-Faith (FS)							38	37		
Internality (LOC)							29	41		
Anger Expression (SAAF)									-48	-50
Anger (TPI)									-44	-54
Anger Control (SAAF)									39	36
Shame/Empathy (AIM)									30	40
Rationality (IPBS)					26	25			26	31
Self Reflection (I)[a]	23									

Note. Decimal points are omitted. Underscored beta weights are based on Sample 2.
N = Neuroticism, E = Extraversion, O = Openness, C = Conscientiousness, A = Agreeableness. With minor exception, noted by superscript a, betas are shown only if the unweighted average from both samples was greater than or equal to .25 and if both coefficients exceeded .15. All betas significant at $p < .0001$.

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DISCUSSION

The current research was undertaken with two central aims: (1) to examine the extent to which personality instruments commonly employed in studying the relationship between personality and health can be understood with reference to a smaller set of overarching dimensions, and (2) to determine whether this smaller set of dimensions converges with fundamental dimensions of personality derived from basic personality research (Digman, 1990). These data suggest that many of the most widely-studied personality-health constructs can be conceptualized as tapping one of three broad dimensions. When examined in relation to established general domains of personality, these three dimensions appear interpretable as aspects of neuroticism, extraversion, and agreeableness.

Of these three domains, neuroticism and extraversion seem to have received the most attention. A somewhat narrower range of health-relevant personality constructs, i.e., the tendency toward outward expression of anger and hostility, can be understood in terms of agreeableness. Notably, the tendency to inhibit expression of anger was primarily associated with neuroticism rather than agreeableness. This finding is consistent with the distinction between neurotic and antagonistic hostility (Dembroski & MacDougall, 1985), and is significant insofar as research suggests that the latter may play an important role in coronary heart disease (Costa, McCrae, & Dembroski, 1988).

Whether or not this focus on aspects of neuroticism is unwarranted as suggested by some (e.g., Stone & Costa, 1990), it is apparent that other, potentially relevant, domains have been relatively neglected. In contrast to the extensive representation of neuroticism, extraversion, and--to a lesser extent--agreeableness, few indexes of openness and conscientiousness were identified. Moreover, these indexes (i.e., motive-reflection, self-faith, and internal locus of control) are more typically associated with domains other than openness and conscientiousness. Thus, to the extent that these findings accurately reflect the breadth of constructs currently employed in health-relevant personality research, the domains of conscientiousness and openness seem somewhat understudied. Insofar as conscientiousness seems essential to the successful execution of health-related behavior and openness to experience may be associated with high-risk health behavior, both dimensions would appear to be particularly fruitful areas for future research.

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Locating health-related personality constructs within the space defined by basic dimensions of personality has clear heuristic value: (1) it provides a descriptive framework for integrating existing research, (2) it brings a broader perspective to the process of construct explication and instrument development, and (3) it assists identification of future research directions. In recognizing the potential value of this perspective, however, it is important to note that this broader unit of analysis is not necessarily any more meaningful than others (see Briggs, 1989; Carver, 1989; and Funder, 1991, for alternative perspectives on the most fruitful level of analysis of personality constructs).

Potentially important information is necessarily lost as one moves to a higher level of abstraction. Thus, differentiated facets of these broad domains may have conceptual and empirical utility independent of the broader dimensions under which they can be subsumed. For example, depending upon one's purposes, it may be as important to differentiate between facets of extraversion like positive affect (e.g., joy) and positive cognition (e.g., optimism) as to distinguish between the broad dimensions of extraversion and neuroticism.

Moreover, without adequate explication of primary facets of personality--and the instruments designed to measure them--research aimed at identifying the most appropriate level of analysis can go astray. For example, Smith et al. (1989) have claimed that the LOT is entirely redundant with neuroticism. By contrast, these results suggest that the LOT can not be fully understood without reference to additional broad domains of personality. Thus, rather than constituting antithetical approaches to understanding the relationship between personality and health, alternative levels of analysis provide potentially complementary perspectives.

In summary, a unified network of health-relevant constructs--anchored by basic dimensions of personality--provides a richer context in which to study the potential link between personality and health. Subtle, but potentially significant, differences among constructs will continue to inspire the creation of new instruments. Additionally, the development of new inventories may be justifiable to remedy deficiencies in preceding measures. Nevertheless, for health-related personality research to move forward as a credible area of inquiry, the utility of new constructs and instruments must be demonstrated with respect to a broad network which consists of superordinate as well as primary dimensions of personality. Further research is, of course, needed to address the generalizability of these findings. It will be necessary, for example,

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to establish that these data are characteristic of other populations. Future study is also required to determine whether similar results would have emerged had other instruments been chosen for study. Additional research is also needed to examine whether differentiated facets of broader domains of personality provide enhanced explanatory or descriptive power or whether these facets are essentially redundant with one another or with the broader domains under which they are subsumed.

Finally, in discussing the potential advantages of the five-factor model as a unifying frame of reference, it is also essential to note some potential shortcomings of this perspective. First, the five-factor model of personality represents only one of several possible organizing schemes. Moreover, to the degree that this model is fundamentally atheoretical, one must be mindful of arriving at a false consensus based on description rather than true understanding. Nevertheless, insofar as description precedes theoretical understanding, we believe that explicit linkage of health-related constructs to basic dimensions of personality constitutes a significant step in the progression of health-related personality psychology.

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APPENDIX 1

Table A

Life Orientation Test (LOT) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content	Factors	
	I	II
I. Pessimism		
Things never work out the way I want them to.	.73	-.28
	.77	-.16
I hardly ever expect things to go my way.	.65	-.20
	.63	-.23
I rarely count on good things happening to me.	.65	-.22
	.57	-.30
If something can go wrong for me it will.	.53	-.12
	.45	-.18
II. Optimism		
I always look on the bright side of things.	-.17	.72
	-.26	.69
I'm a believer in the idea that "every cloud has a silver lining."	-.24	.54
	-.17	.54
I am always optimistic about my future.	-.14	.52
	-.16	.42
In uncertain times, I usually expect the best.	-.19	.52
	-.13	.40

Note. Underlined loadings are based on Sample 2.

Table B

Hopelessness Scale (HS) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content	Factors	
	I	II
I. Pessimism		
Things just won't work out the way I want them to.	.64	-.22
	.69	-.32
I never get what I want so it's foolish to want anything.	.54	-.35
	.65	-.35
I just don't get the breaks, and there's no reason to believe I will in the future.	.54	-.30
	.61	-.29
It is very unlikely that I will ever get any real satisfaction in the future.	.56	-.31
	.60	-.34
I don't expect to get what I really want.	.50	-.34
	.64	-.33
My future seems dark to me.	.65	-.23
	.59	-.31
The future seems vague and uncertain to me.	.62	-.27
	.52	-.29
I can't imagine what my life would be like in ten years.	.44	-.04
	.40	-.01
II. Optimism		
I look forward to the future with hope and enthusiasm.	-.26	.66
	-.21	.64
I have great faith in the future.	-.39	.59
	-.34	.63

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Table B (Continued)

Item Content	Factors	
	I	II
When I look ahead to the future, I expect to be happier than I am now.	-.05	.63
	-.22	.62
In the future, I expect to succeed in what concerns me most.	-.28	.56
	-.19	.58
I can look forward to more good times than bad times.	-.39	.52
	-.36	.55
When things are going badly, I am helped by knowing they can't stay that way forever.	-.22	.45
	-.12	.51
I expect to get more of the good things in life than the average person.	-.31	.55
	-.27	.49
Excluded Items		
All I can see ahead of me is unpleasantness rather than pleasantness.	.67	-.42
	.65	-.40
There's no use in really trying to get something I want because I probably won't get it.	.60	-.36
	.55	-.54
I might as well give up because I can't make things better by myself.	.46	-.33
	.44	-.43
My past experiences have prepared me well for the future.	-.34	.22
	-.29	.41
I have enough time to accomplish the things I most want to do.	-.24	.28
	-.15	.26

Note. Underlined coefficients are based on Sample 2.

Table C

Faith in Self (FS) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content	Factors	
	I	II

I. Faith in Self

Nothing is impossible if I really put my mind to it.	.80	.06
	.72	.11
I can succeed in most any endeavor to which I set my mind.	.64	.12
	.79	.09
I feel that chances are very good that I can achieve my goals in life.	.52	.25
	.63	.21
If a person believes in himself, he can make it in this world.	.51	.13
	.69	.25
Man has a lot of problems but none he won't eventually be able to solve.	.25	-.02
	.21	.05

Excluded Item

When put to the test I would remain true to my ideals.	.19	.70
	.47	.40
I feel I am better off to rely on myself for a solution when things are looking really bad.	.00	.41
	.07	.51

Note. Underlined factor loadings are based on Sample 2.

Table D

Internal-External Control Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content	Factors	
	I	II
I. External Control		
When I get what I want, it's usually because I'm lucky.	.79	-.13
	.67	-.25
I believe that chance or luck plays an important role in my life.	.56	-.13
	.67	-.11
Often, there is no way I can protect nyself from bad luck.	.44	-.27
	.41	-.16
II. Internal Control		
I am usually able to protect my own interests.	-.16	.57
	-.07	.58
When I make plans, I am almost certain to make them work.	-.29	.49
	-.09	.56
My life is determined by my own actions.	-.10	.45
	.00	.43
When I get what I want, it's usually because I worked hard for it.	-.12	.37
	-.18	.62
Excluded Items		
It's not always wise to plan too far ahead because many things turn out to be a matter of good or bad fortune.	.25	-.18
	.18	.06

Note. Underlined loadings are based on Sample 2.

Table E

Affect Intensity Measure (AIM) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content	Sample 1	Sample 2
Joy (Factor I)		
When I am happy I feel like I am bursting with joy.	.82	.69
When I'm happy I bubble over with energy.	.68	.64
My happy moods are so strong that I feel like I'm "in heaven."	.64	.61
When something good happens, I am usually more jubilant than others.	.59	.59
When things are going good I feel "on top of the world."	.55	.65
Contentment (Factor II)		
When I am happy the feeling is more like contentment and inner calm than one of exhilaration and excitement.	.70	.70
I would characterize my happy moods as closer to contentment than to joy.	.70	.62
When I feel happiness, it is a quiet type of contentment.	.64	.55
When I know I have done something very well, I feel relaxed and content rather than excited and elated.	.59	.59
When I succeed at something, my reaction is calm contentment.	.50	.58

Table E (Continued)

Item Content	Sample 1	Sample 2
Shame/Empathy (Factor III)		
When I do something wrong I have strong feelings of shame and guilt.	.67	.55
I feel pretty bad when I tell a lie.	.64	.56
When I feel guilty, this emotion is quite strong.	.59	.47
The sight of someone who is hurt badly affects me strongly.	.39	.54
Seeing a picture of some violent car accident in a newspaper makes me feel sick to my stomach.	.38	.39
Imperturbability (Factor IV)		
When I get angry it's easy for me to still be rational and not overreact.	.54	.51
I can remain calm even on the most trying days.	.50	.48
"Calm and cool" could easily describe me.	.49	.56
My negative moods are mild in intensity.	.43	.48
When I am nervous I get shaky all over.	-.43	-.35
My friends would probably say I'm a tense or "high-strung" person.	-.39	-.38
When I do feel anxiety it is normally very strong.	-.36	-.34

Note. All loadings greater than .30 are shown.

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Table F

Trait Personality Inventory (TPI) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content		Factors	
	I	II	III

I. Anger

I am quick tempered.	.85		
	.79		
I have a fiery temper.	.85		
	.83		
I am a hotheaded person.	.79		
	.83		
I fly off the handle.	.78		
	.71		
When I get frustrated, I feel like hitting someone.	.60		
	.61		
When I get mad, I say nasty things.	.57		
	.52		
I get angry when I'm slowed down by others mistakes.	.44		
	.39		

II. Anxiety

I lack self-confidence.		.73	
		.68	
I feel like a failure.		.67	
		.65	
I feel inadequate.		.60	
		.57	
I feel satisfied with myself.		-.50	
		-.59	

Table F (Continued)

Item Content	I	Factors II	III
I feel nervous and restless.		.48 .45	
I wish I could be as happy as others seem to be.		.56 .51	
I feel secure.		-.54 -.54	
I get in a state of tension or turmoil as I think over my recent concerns.		.50 .48	
I worry too much over something that really does not matter.		.48 .45	
I am a steady person.		-.35 -.38	

III. Curiosity

Item Content	I	Factors II	III
I feel like exploring my environment.			.50 .57
I feel curious.			.65 .57
I feel interested.			.66 .63
I feel inquisitive.			.61 .65
I feel eager.			.52 .58
I am in a questioning mood.			.47 .52

Table F (Continued)

Item Content	Factors		
	I	II	III
I feel stimulated.			.36
			.43
I feel mentally active.		-.36	.42
			.50
Excluded Items			
I feel disinterested.		.45	
		.48	
I feel bored.		.43	
		.50	
I feel annoyed when I am not given recognition for doing good work.	.35	.42	
	.35		
I feel infuriated when I do a good job and get a poor evaluation.	.33	.36	
It makes me furious when I am criticized in front of others.	.31	.27	
	.40	.37	

Note. Underlined loadings are based on Sample 2. In general, factor loadings between -.30 and .30 are not shown.

Table G

Anger Expression (SAAF) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content		Factors	
	I	II	III

I. Anger Control

I control my behavior.	.75		
	.71		
I keep my cool.	.71		
	.64		
I can stop myself from losing my temper.	.70		
	.54		
I try to be tolerant and understanding.	.67	-.31	
	.63		
I control my temper.	.67		
	.63	-.32	
I control my anger feelings.	.66		
	.65		
I am patient with others.	.57		
	.57		
I calm down faster than most other people.	.48		
	.50		

II. Anger Expression

I say nasty things.	-.31	.63	
		.62	
I make sarcastic remarks to others.		.59	
		.49	
I express my anger.	-.32	.59	
		.60	
I argue with others.		.58	
		.58	

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Table G (Continued)

Item Content		Factors	
	I	II	III
I lose my temper.	-.46	.53	
	-.40	.60	
I do things like slam doors.		.52	
		.46	
If someone annoys me, I'm apt to tell him or her how I feel.		.48	
		.57	
I strike out at whatever infuriates me.		.44	
		.43	.31

III. Anger Inhibition

Item Content	I	II	III
I am irritated a great deal more than people are aware of.			.60
			.53
I keep things in.			.57
		-.32	.44
I am angrier than I am willing to admit.			.57
			.49
I withdraw from people.			.50
			.47
I boil inside, but I don't show it.	.42		.49
	.29	-.32	.45
I tend to harbor grudges that I don't tell anyone about.			.47
			.55
I pout or sulk.			.30
			.30
I am secretly quite critical of others.			.27
			.36

Note. Underlined loadings are based on Sample 2. In general, factor loadings between -.30 and .30 are not shown. The highest loading of each item is shown.

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Table H

Self-control Schedule (SC) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content	Factors		
	I	II	III

I. Emotion Management

When an unpleasant thought is bothering me, I try to think of something pleasant.	.75		
	.69	-.33	
When I am feeling depressed I try to think about pleasant events.	.68		
	.67		
When I am in a low mood, I try to act cheerful so my mood will change.	.60		
	.65		
When I am depressed I try to keep myself busy with things that I like.	.56		
	.58		

II. Negative Thoughts

Although it makes me feel bad, I cannot avoid thinking about all kinds of possible catastrophes in the future.			.74
			.44
I cannot avoid thinking about mistakes I have made in the past.			.56
			.64
Quite often I cannot overcome unpleasant thoughts that bother me.			.49
			.47

Excluded Items

When I feel pain in a certain part of my body, I try not to think about it.		.90	
	.52	.72	

Table H (Continued)

Item Content		Factors	
	I	II	III
When I feel pain in my body, I try to divert my thoughts from it.		.81	
	.44	.68	
Often by changing my way of thinking, I am able to change my feelings about almost everything.			.13
	.25		.22

Note. Underlined loadings are based on Sample 2. In general, factor loadings between -.30 and .30 are not shown.

Table I

Introspection (I) Varimax-rotated Factor Loadings for Samples 1 and 2

Item Content	Factors	
	I	II

I. Motive Introspection

	I	II
I think a lot about why I feel the way I do.	.72	
	.72	
I am interested in why I behave the way I do.	.69	
	.74	
I am always trying to figure myself out.	.60	
	.55	
I often examine my inner motives.	.54	
	.59	
I am interested in psychology.	.44	
	.51	

II. Self Introspection

	I	II
When I am alone, I think about myself a lot.	.45	.66
		.77
I am often the subject of my own daydreams.	.34	.58
		.63
I think about myself a lot.	.31	.36
		.62

Item Excluded

	I	II
I am worried about meaning in life.	.36	
	.25	.32

Note. Underlined factor loadings are based on Sample 2.
With one exception, loadings between -.30 and .30 are not shown.

Table J

Bivariate Relations for NEO-FFI Indexes

Index	N	E	O	C	A
N	----	.34	-.12	-.46	-.30
E	-.36	---	.04	.31	.24
O	-.19	-.18	---	-.06	.01
C	-.45	.44	.05	---	.35
A	-.24	.26	.04	.36	---

Note. Underlined coefficients are based on Sample 2.

N = Neuroticism
E = Extraversion
O = Openness
C = Conscientiousness
A = Agreeableness

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13. ABSTRACT (Maximum 200 words)

The current study was undertaken to identify overarching themes characteristic of health-related personality research and to determine the extent to which these constructs converge with broad domains of personality. Factor analysis of representative instruments administered to two samples of Navy recruits revealed three general domains. Multiple regression indicated that these domains corresponded to three of five general dimensions of personality: neuroticism, extraversion, and agreeableness. By contrast, two remaining dimensions (i.e., openness and conscientiousness) appeared to be substantially neglected in personality-health research. These findings provide evidence of the utility of the five-factor model of personality as a framework for studying personality-health relations.

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